USDA APHIS PPQ CPHST

CPHST News

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ID of Light Brown Apple Moths Using DNA Barcodes

The light brown apple moth (LBAM), *Epiphyas postvittana*, is an important agricultural pest. Native to Australia and widely spread in New Zealand, LBAM was detected in California this past year prompting a pest monitoring program for the moth. If left uncontrolled, LBAM could cause significant damage to many different kinds of crops, including stone fruit (peaches, plums, nectarines, cherries, and apricots), pome fruit (apples and pears), grapes, and citrus. Official confirmation of LBAM detections are performed using adult morphology. A method based purely on morphology runs the risk of grouping moths that are relatively unrelated. This is a case in point with LBAM, because there are other moths in California that have similar morphological characteristics. In contrast to morphology, identifying LBAM by genetic similarities, through DNA-based methods, is applicable to all life stages of the moth. To assist in accurate identification of larvae, the CPHST Lab, Mission, TX, in collaboration with the California Department of Food and Agriculture Plant Pest Diagnostics Branch in Sacramento, CA, developed a DNA-based identification tool for LBAM. This was accomplished by studying the DNA barcodes of LBAM and other moths in California.

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Species1 TTTGGTATTTGAGCAGGTATAGTAGGAACA  [30]
Species2 TTTGGAATTTGAGCAGGTATAGTAGGAACA  [30]
               *
Species1 TCCCTAAGATTATTAATTCGAGCAGAATTA  [60]
Species2 TCTCTAAGATTATTAATTCGAGCTGAATTA  [60]
          *                    *
Species1 GGAAACCCTGGATCATTAATTGGAGATGAT  [90]
Species2 GGAAATCCAGGATCATTAATTGGTGATGAC  [90]
              * *                * *
Species1 CAAATTTATAATACTATTGTCACAGCTCAT  [120]
Species2 CAAATTTATAATACTATTGTAACAGCTCAT  [120]
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An example of DNA sequences of 120 nucleotides from two species. Nucleotide differences between species are indicated in yellow with asterisks. The number of nucleotides is indicated in brackets after each line. A total of eight differences are present, indicating that these species are over 6 percent different for the gene sequence. The LBAM database comprises DNA sequences of over 600 nucleotides each.

The DNA barcode is conceptually similar to a commercial barcode in that a single, standardized procedure is used to analyze many different insect species. Just as a company uses a single barcode-scanning system to analyze all items in its store, the DNA barcode uses DNA sequences for species identification. DNA sequences are the arrangement of nucleotides (i.e., A, T, C, and G) within a strand of DNA (see figure). Since DNA mutates over evolutionary time, different species are expected to have different DNA sequences. In practice, DNA sequences are "read" (i.e., sequenced) from an insect's genome

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DNA BARCODING (CONTINUED)

using PCR-based technology and analyzed with the aid of computational software. The sequences are then compiled into a database. When an insect of unknown identity is detected, its sequence is also "read" and then compared to the database to determine its identity.

Unlike a commercial barcode in which every product has a unique code, every species does not necessarily have a single, unique DNA sequence. However, when the number of differences between two species is relatively high, it is still possible to use DNA sequences for species identification.

We generated a database of LBAM and five other moth species using a portion of the *cytochrome oxidase* I gene. Over 50 moths were collected in California and from lab colonies in New Zealand and Australia to characterize variations within LBAM. No two LBAM moths were more than 1 percent different. In comparison, all LBAM sequences were at least 7 percent different from the sequences of other moth species in California. Based on these findings, the database behaved according to barcode principles. Consequently, the DNA sequences were used as surrogates for moth taxonomy. This tool has been applied in the identification of over 100 moths from nurseries in California this year.

Submitted by Norman Barr

BIOCONTROL OF THE EMERALD ASH BORER

The emerald ash borer (EAB), *Agrilus planipennis* (Coleoptera: Buprestidae), is an invasive wood boring beetle from Asia threatening North America's ash trees (*Fraxinus* spp.). It was introduced into the Detroit, MI, area probably during the 1990s and was identified as the cause of ash mortality in southeastern Michigan in 2002. EAB is now considered established in urban and forested ecosystems throughout areas of Michigan, Indiana, Illinois, Pennsylvania, Maryland, and Ontario, Canada. EAB is well suited for climatic conditions in North America and destroys entire stands of ash.

EAB larvae feed on ash phloem, cutting off nutrients and resulting in tree death after approximately 4 years. (photo by Art Wagner, www.forestryimages.org)

Although a few parasitoids, predators, and pathogens already present in the United States do attack EAB, mortality from these sources is less than 2 percent and is not contributing to population control. The lack of natural enemies capable of suppressing EAB populations below a density threshold tolerable for survival of native ash trees is especially troubling and supports the need to introduce parasitoids that coevolved with EAB in Asia for biological control in North America.

Foreign exploration to discover host specific, effective natural enemies was conducted and found most successful in China. In China, EAB is typically at low density and is considered only a periodic pest of ash. Since 2003, several parasitoids have been discovered in collaboration with scientists at the Chinese Academy of Forestry.

One promising biocontrol agent is *Spathius agrili* (Hymenoptera: Braconidae), which was found parasitizing EAB larvae in Jilin Province and Tianjin City. The emergence of *Spathius* adults in the spring coincides with the presence of third- and fourth-instar EAB larvae, which are the preferred host stages. This species has three to four generations per year in Tianjin, and up to 90 percent parasitism has been found in some ash stands.

Spathius are reared in EAB larvae dissected from infested ash logs or raised on artificial diet then implanted in small ash branches. Host specificity testing has been completed to determine the risk of parasitoid release to native wood borers. Although a few non-target larvae in the genus *Agrilus* were attacked, the attack percentage was significantly lower than on EAB. *Spathius* did not parasitize several of the *Agrilus* species tested, other wood boring beetles, or wood-boring Lepidoptera. Olfactometer studies revealed that female *S. agrili* were only attracted to ash and willow leaves; they were not attracted to 11 host plants of other common wood-boring insects. Surveys of 2,072 larvae from *Agrilus* spp. (not EAB) in China did not reveal parasitism by *S. agrili*.

Spathius agrili (photo by Dr. Yang Zhong-qi, Chinese Academy of Forestry)

Based on research results, federal and state permits release were granted in 2007, and *S. agrili* releases were made at three release sites beginning in August and continued through September. Parasitoids will be reared and stockpiled in cold storage for release in larger numbers at more sites in 2008.

Submitted by Juli Gould

EXOTIC PEST INFORMATION COLLECTION AND ANALYSIS— BIOSURVEILLANCE FOR APHIS-PPQ

In order to fulfill its safeguarding mission, PPQ depends on reliable and up-to-date information on exotic plant pests worldwide. For example, knowledge of unusual pest outbreaks in another country can help focus port-of-entry inspections; knowledge of host or distribution changes is essential for the preparation of accurate pest risk analyses; and notable pest interceptions in other countries may assist PPQ in identifying new pathways of introduction.

Pertinent information is available to those who know how to search in a variety of open sources, such as books, scientific journals, and newspapers. Inarguably, the Web has become the single most important venue for accessing these information sources and others like listservs, webpages, and web-accessible databases.

While numerous groups and individuals within PPQ have independently gathered such information historically, their efforts were not coordinated, and there was no mechanism to effectively distribute and archive their findings. Moreover, foreign language sources were often ignored. It is clear that there is need for more coordination in a PPQ-wide biosurveillance approach.

The Exotic Pest Information Collection and Analysis (EPICA) project was conceived in response to this need. Modeled after a similar initiative in APHIS-VS, EPICA combines the use of modern technologies with subject matter and foreign language expertise to create a streamlined, efficient process that queries and analyzes electronic information from various sources to identify global emerging pest situations that potentially threaten the United States.

EPICA is a cooperative effort of CPHST and the Center for Integrated Pest Management (CIPM) at N.C. State University in Raleigh, NC. The project managers, Drs.Woody Bailey and Heike Meissner, coordinate with four highly qualified CIPM research associates in the application of web search technologies to find and analyze relevant pest news. EPICA's primary output is a bi-weekly pest notification containing short write-ups of plant pest news from around the globe, supplemented with pertinent background information and placed into a regulatory context. The PPQ Executive Team is currently considering where and how these notifications will be distributed.

A key priority for EPICA is to become fully integrated with related PPQ programs. For example, EPICA is linked with the Global Pest and Disease Database (GPDD), an additional project within the Exotic Pest Information (EPI) Program managed by Dr. Bailey. The GPDD is being updated to provide a searchable archive for EPICA pest notifications. EPICA also collaborates with the APHIS-VS-Center for Epidemiology and Animal Health (CEAH), the Pest Alert System (PAS) of the North American Plant Protection Organization, and the PPQ New Pest Advisory Group (NPAG). Finally, EPICA notifications are distributed to the APHIS Offshore Pest Information Program's (OPIP) Exotic Pest Working Group for consideration as OPIS reports.

The EPICA Team: Left to right— Jennifer Fritz (technical writer), Heike Meissner (entomologist), Laura Jeffers (entomologist), Charles Thayer (plant pathologist), Woody Bailey (entomologist), Jung "Woogie" Kim (entomologist).

EPICA is dedicated to providing continued support for PPQ's pest information needs while exploring new technologies to increase its efficiency and extend its reach. The EPICA team looks forward to continuing collaboration and increased coordination agency-wide as APHIS develops its biosurveillance communication network. If you have any questions about EPICA, please contact Woody Bailey (woodward.d.bailey@aphis.usda.gov).

Submitted by Woody Bailey, Heike Meissner & Jennifer Fritz

EPICA
EXOTIC•PEST•INFORMATION•COLLECTION•and•ANALYSIS

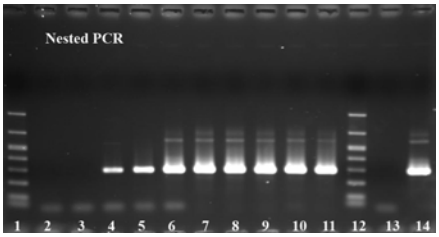
THE NPPLAP INCREASES DIAGNOSTIC CAPACITY

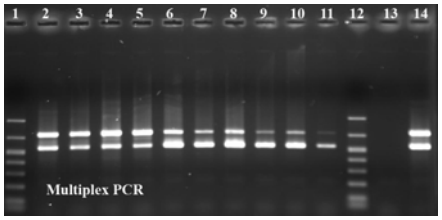
The CPHST National Plant Protection Lab Accreditation Program (NPPLAP) was formed in 2006 to increase the capacity and assure the quality of diagnostics performed by third-party laboratories for high consequence regulatory plant pathogens in the United States. To accomplish this, NPPLAP actively engaged laboratories outside the PPQ system to help provide diagnostics in an efficient and timely manner. In addition to some state department of agriculture labs, many of the participating labs are within the USDA CSREES National Plant Diagnostics Network (NPDN) representing several land grant universities.

In many ways, NPPLAP resulted from the successful CPHST Provisional Approval Program designed for *Phytophthora ramorum* molecular diagnostics. Like NPPLAP, a key component of that program was to supply annual plant pathogen-specific validated test panels to diagnosticians so that proficiency in the diagnostics used in the program could be documented and certified. The proficiency test (PT) panel development, validation, and preliminary scoring was conducted by the CPHST Lab, Beltsville, MD. The Beltsville Lab completed its third full year of supplying PT panels and evaluation to NPPLAP for the 38 program participants.

The immediate objectives of NPPLAP are to build upon the earlier CPHST efforts and expand certification of diagnostic capacities to include both the Huanglongbing (HLB or citrus greening) pathogen and the potato cyst nematode (*Globodera pallida* and *G. rostochiensis,* a.k.a. PCN). To assure HLB diagnostic capacity, a lab accreditation program was developed by incorporating useful components of the *P. ramorum* Provisional Approval Program and the characteristics of HLB diagnostics, including the development and validation of PT panels by the Beltsville Lab. The PT panel for HLB incorporates infected plant tissue as well as DNA samples, which allows assessment of analyst DNA extraction proficiency as well as their ability to run and interpret real-time PCR results. The PT panel for HLB is slated to be released in October 2007. This will represent the first select agent plant pathogen PT panel released by PPQ under the guidance of the APHIS Select Agent Program and the provisions of 7 CFR 331.

Thus far, PT panels in the *P. ramorum* Provisional Approval Program have been constructed using host and pathogen extracted nucleic acid. Following the successful development of the HLB tissue-based PT panel, the Beltsville Lab began a second generation of the *P. ramorum* panel with assistance from ARS who will supply infected plant materials for the panel development. This new panel will incorporate lyophilized infected plant host tissues in order that proficiency in the ELISA and DNA extraction components of the diagnostics can also be assessed. The NPPLAP and Beltsville Lab will continue to engage scientists within ARS, land grant universities, and the international scientific community in the development of future PT panels and NPPLAP.





Submitted by Pat Shiel & Laurene Levy

RISK ANALYSIS 101 WORKSHOP

The CPHST Plant Epidemiology and Risk Analysis Laboratory (PERAL) in Raleigh, NC, organized and delivered a one-week Risk Analysis (RA) 101 Workshop in July 2007. The workshop agenda included lectures, exercises and facilitated discussions that were delivered by PERAL and Plant Health Programs (PHP) Commodity Import Analysis and Operations (CIAO) staff. The RA 101 workshop was designed so that participants gained an understanding of the role of and rationale for conducting pest risk analysis; the role of science in forming policy and aiding in regulatory decision-making; the legal and regulatory framework that supports and guides the application of pest risk analysis, both at national and international levels; and the tools and resources available to be able to accurately prepare, direct and evaluate a pest, commodity or pathway risk analysis. The workshop had twenty-seven participants that included international plant protection officials from eleven countries: Vietnam, Philippines, China, Mongolia, Taiwan, Egypt, Honduras, Mexico, Dominican Republic, Panama and Senegal; Florida A&M University; and Eastern Region

Continued on page 5

RA 101 (CONTINUED)

and CPHST personnel.

Lectures, exercises and discussions were presented and facilitated by the PERAL laboratory director, Bob Griffin; risk analysts, Christina Devorshak, Tony Koop, Betsy Randall-Schadel, Keith Colpetzer, Dan Borchert, Alison Neely and Mike Hennesey; agricultural economist, Lynn Garrett; training specialist, Stephanie Bloem; Risk and Pathway Analysis National Science Program Leader, Ron Sequeira; and PHP CIAO senior risk manager, Walter Gould.

Vic Harabin, acting CPHST director, welcomed the participants on the first day. Logistics for food were jointly organized and coordinated by Aziza Clark (CPHST) and Matt Wittek and Stacey Newton (IS). Betsy Randall-Schadel (CPHST) organized an evening outing to a Durham Bulls baseball game and an afternoon visit to the North Carolina Farmers Market. Workshop binders containing copies of all the presentations were compiled by Megan Remmers (CPHST-TQAU) and supplies and CD's were managed by Amy Mize (CPHST-PERAL).

RA 101 Group: Back from left to right— John Rogers, Jin Quan Zhu, Walter Gould, Walter Gutierrez, Mike Hennesey, Chimedyam Dorjsuren, Duong Minh Tu, Agustin Ramos, Marc Gilkey, Lynn Garret, Don Seaver
Middle from left to right— Mahmoud Orabi, Tailin Liao, Bob Schall, Stacy Newton, Terry DiLeone, Dave Prokrym, Larni Mary Soliman, Mikell Tanner, Veronica Berjarano, Raphael Coly, Paula Morales, Yan Xu, Yu Takeuchi, Megan Remmers, Yu-Yen Lu, Tara Holtz, Stephanie Kubilus, Oulimathe Paraiso, Bob Griffin, Christina Devorshak
Front from left to right— Paul Larkins, Betsy Randall-Schadel, Scott Weihmann, Stephanie Bloem, Cesar Sandoval, Ron Sequeira

We hope to offer RA 101 again in 2008 and to translate the materials into Spanish in order to deliver this important training in two languages – Stay tuned.

Submitted by Stephanie Bloem

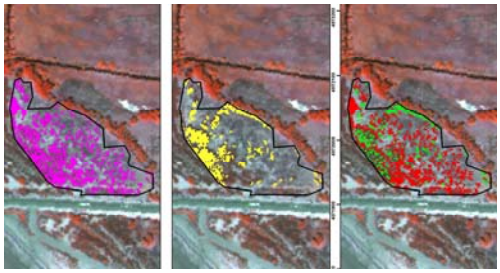
MAPPING SALTCEDAR DISTRIBUTION

PPQ needs to evaluate the most effective methods to map saltcedar (*Tamarisk* spp.) distributions in the West to collaborate with on-going and future biocontrol applications. To thoroughly investigate the success of a biocontrol application, highly accurate baseline and concurrent data is essential.

The mapping saltcedar distribution study evaluated the effectiveness of using the remote sensing software, Erdas Imagine (Leica Geosystems) and Feature Analyst (Visual Learning Systems), to map the distribution of saltcedar using airborne collected hyperspectral image (HSI) data. HSI data can acquire a greater amount of spectral information and a higher degree of spatial resolution over typical multispectral options found in satellite image data or aerial photography.

The study site is located in northern Wyoming within the Bighorn National Recreation Area and involved in a USDA APHIS biocontrol study where the insect, *Diorhadba elongata*, was released in an effort to reduce the saltcedar population.

Study results show that it is possible to map the distribution of saltcedar at this study site and monitor changes that occurred between the dates of 2002 and 2004. The overall mapping accuracy averaged 80 percent and was validated by GPS polygons that depicted areas where saltcedar defoliation is occurring. The majority of defoliation polygons supported an average 50 percent reduction in saltcedar distribution. In addition, results show that saltcedar decrease is not consistent throughout the site suggesting that environmental factors may influence the dispersal of the biocontrol agent.



Left to right—2002 distribution, 2004 distribution, 2002 & 2004 distribution changes

The potential for this type of quantitative analysis to support biocontrol programs is extensive. The evaluated techniques can be applied to other saltcedar biocontrol release sites; moreover, it can be applied to other weed biocontrol programs, not just saltcedar.

Submitted by Lisa Kennaway

WHAT IS COSTA?....

Here's a hint: It is not an undiscovered beach or new Italian pastry. True to form, it is an acronym meaning "Coordinating Office for Science and Technology Assessment." The Coordinating Office, previously known as the Coordinating Office of Technology, Information, and Assessment (COTIA), was created by former APHIS Administrator Bobby Acord in 2003. Early in 2007, the APHIS Management Team endorsed a name change for the Coordinating Office that reflects the new focus in COSTA's activities. COSTA was established to coordinate the science and technology that supports the management of APHIS programs. COSTA examines, evaluates and assesses information and activities related to the scientific needs and technology required by APHIS. This support includes recommending guidance, direction and policies for APHIS management and the use of science and technologies when appropriate.

APHIS generates an enormous amount of science and technology (S&T) work but few may appreciate this productivity because the work is contained within units. Keeping track of this work is a challenge. Periodically, the Agency must inventory its S&T needs (projects) and products in order to minimize redundancy and costs. This is a job for COSTA, who will periodically collect and review S&T needs at the Agency-level. These inventories also are intended to promote research and development (R&D) cooperation where possible, look for ways to leverage financial investments in R&D, and broker new S&T to all APHIS work units. Inventories are not intended to limit research areas, challenge priorities or undermine authorities. In this coming fiscal year, COSTA will initiate an inventory of science projects in the Agency.

In a related matter, the Agency must inventory the S&T expertise within APHIS. Programs employ substantial scientific and technical expertise in many APHIS units, but the limits of S&T capacity remain undocumented. This information is critical to strategic planning for programs and staffing. Further, the inventory should identify subject matter experts who can serve on expert panels and working groups for APHIS. In this coming fiscal year, COSTA will begin the process of producing an inventory of existing S&T knowledge, skills, and abilities.

COSTA forms technical working groups capable of addressing a broad slate of crosscutting issues that involve S&T. Most recently, scientists completed a whitepaper on synthetic genomics. Other whitepapers are planned for FY08. These reports are intended to alert APHIS leadership of fast moving developments in areas that influence the Agency's business. Other activities for COSTA include the assessment of new technologies that are submitted to APHIS leadership. Often, sales representatives and developers of new ideas/ technology will contact APHIS leadership to promote or sell products to the Agency. These requests are passed to COSTA for response. COSTA identifies APHIS scientists with expertise to assess new ideas/ technology and report to appropriate unit officials on the potential value of the products to the Agency. These reports are filed for future reference involving similar solicitations.

Another designated role of the COSTA is to represent APHIS in intergovernmental committees, workgroups, and task forces. APHIS experts are expected to speak for APHIS, but may only consider issues from a program's viewpoint. In this coming year, COSTA will endeavor to bring a greater cohesiveness to APHIS representation at multiple government wide tables.

COSTA operates under a Charter and Board of Directors. The Charter was approved by the APHIS Program Leaders Group (PLG). Membership in COSTA includes all units of APHIS; the Board consists of a member from Biotechnology Regulatory Services, Information Technology Division, Plant Protection and Quarantine, Veterinary Services, Wildlife Services, and Animal Care. Other units represented in COSTA activities include VS Centers for Epidemiology and Animal Health, PPQ Center for Plant Health Science and Technology, International Services, Investigative and Enforcement Services, the Office of Management and Homeland Security and Policy and Program and Development. The Board chair is selected by vote of the Board and approved by the PLG. The COSTA chair of is appointed for two years. Dr. Gordon Gordh is the current chair.

Board of Directors

The Board is comprised of one member from each of the following program units or divisions within APHIS:

Gordon Gordh, PPQ Science Advisor, Chair; Sally McCammon, Science Advisor, Biotechnology Regulatory Services; Greg Parham, APHIS Chief Information Officer; Randall Levings, Science Advisor, VS Emergency Management; Rick Hill, VS Centers for Veterinary Biologics; Richard Bruggers, WS National Wildlife Research Center; Allan Hogue, Animal Care

Submitted by Gordon Gordh & Deb Millis

GENETICALLY MODIFIED PINK BOLLWORM

A critical feature of a sterile insect technique (SIT) program is the accurate identification of released sterile insects recovered on monitoring traps in the field. Current marking techniques for sterile insects include the use of external fluorescent powders or internal dyes included in the artificial diet. Both of these marking methods are imperfect, sometimes resulting in identification errors. Inaccurate identification of sterile release insects can result in expensive control and quarantine measures, and the undetected establishment of a pest population.

CPHST Lab, Phoenix, AZ, is developing new SIT technology using genetically modified pink bollworm (PBW) that express a fluorescent marker protein for a potential use in the PBW SIT program to eliminate or minimize misidentification. A sterile insect expressing a fluorescent protein recaptured in a monitoring trap can be identified using excitation light and emission filters. Development of a rapid fluorescent marker screening technique could provide more efficient processing of monitoring traps and trap reading automation. As a result of these efficient technologies, the SIT program could realize significant labor cost savings. A genetically marked insect can also be read with PCR techniques to supply a backup identification means of the release insect.

Phoenix Lab scientists completed the first open field test of a genetically marked sterile insect in a direct comparison to the standard APHIS conventional strain used in the pink bollworm program. The purpose of this test was to determine if there are any differences between the field performance and longevity, which is measured by comparing recapture rates and dispersal behavior between the two moth strains. In addition, we wanted to evaluate the accuracy of identifying moth strain by fluorescence versus identification by PCR.

The preliminary findings of the analysis suggest that the performance of the genetically modified pink bollworm is roughly the same as the APHIS conventional strain. Therefore, it may be possible to use the GM strain in the program, which will improve the program's efficiency and monitoring.

A dedicated and effective APHIS-PPQ team, comprised of several equipment specialists, biological science technicians and entomologists, ensured the success of the summer field project. The team designed and built a specialized quarantine mass-rearing and moth collection facility that was able to produce over 300,000 GM sterile PBW per week to run the project. Special mention must be given to equipment specialists Jimmy Moody (CPHST); David Pierce (Western Region); Joe Ploski (Western Region Pink Bollworm Rearing Facility); and Phoenix Lab biological science technicians Mickey Sledge, John Claus, Guolei Tang, Ramona Chomar and Michael Vincent.

Rearing unit with moth collector

Submitted by Greg Simmons

60TH ANNUAL SECRETARY'S HONOR AWARD

The Irradiation and Indian Mango Approval Team was recognized by earning the Secretary's Honor Award from the Acting Secretary of Agriculture, Chuck Conner, for their contributions and accomplishments toward enhancing protection and safety of the nation's agriculture and food supply.

The Secretary's Honor Awards are the most prestigious Departmental awards presented by the Secretary of Agriculture. Employees at all grade levels and private citizens are eligible for recognition.

The Honor Award categories for 2007 reflected the goals of the USDA Strategic Plan for fiscal years 2005-2010.

The members of the team were presented with the Honor Award on October 11, 2007 at the Thomas Jefferson Auditorium in Washington, D.C. The collaborative team consisted of 35 representatives from various APHIS units. The CPHST recipients included Larry Zettler, Scott Wood, Robert Griffin, Ian Winborne, and Leah Millar.

This team truly demonstrated advanced technical competency and dedication to the protection of American agriculture.

GOAL SETTING 101 WITH YOUR WLW REP

In June, the APHIS Work Life Wellness (WLW) coordinators attended the three-day course, "Coaching Healthy Behaviors Certification Training," provided by The Cooper Institute in Dallas, TX. Representing CPHST, I joined 19 other WLW coordinators for this training, which, upon successful completion, certified us to perform wellness coaching.

What does a wellness coach do? A wellness coach helps clients adopt optimal wellness behaviors using specific coaching models to facilitate goal achievement. During sessions, coaches conduct a client assessment, assess motivational readiness for change, and design customized plans.

How would a wellness coach help me create goals in a meaningful way? The key to achieving goals is to devise goals that set you up for success. The "SMART" acronym helps you determine whether you're setting successful goals:

S (Specific) – Goals should be narrow in focus, detailed and action-based.

M (Measurable) – Goals need to be measurable, with criteria to assess change and track progress.

A (Attainable) – Goal setting should consist of a series of short-term goals (3 months or less) en route to a long-term goal (3 months or more) with an action plan for each one. It should be appropriate to your current status, and be a healthy, yet not overwhelming, challenge.

R (Realistic) – Goals must be realistic and you must be willing and able to work toward achievement. Be honest, be positive and do not expect perfection.

R+ (Rewarded) – Successes should be celebrated with rewards that are meaningful to you. These rewards should be simple, enjoyable, and commensurate with the effort.

T (Timed) – Establish a timeline for completion, be it a day, a week or a month.

Example of a SMART goal: *I will lose 5 lbs. in 4 weeks starting October 1st by walking 3 additional times per week for 25 minutes.*

Where should I start on my own? First, evaluate what stage of change you're in. Assess your commitment on a scale of 1-10. If your level isn't at least a 7, you're not in a state of readiness. If you are ready to change, follow the SMART framework above while anticipating barriers and how to overcome them.

Are there any tools available to me to help with this process? I have worksheets and supplemental handouts for goal setting. Worksheets can be posted in your office, on your refrigerator, etc. to serve as reminders. I can also furnish a client assessment sheet to help you examine areas and personal habits which could most benefit from a healthy change. So please contact me if you're interested in any additional tools or just more curious about the training.

Submitted by Kellie Shobe

GET TO KNOW THE NEW CPHST TEAM MEMBERS!

CPHST SPOTLIGHT: BAODE WANG

Baode Wang has been working for CPHST Lab, Otis, MA, since May 1997 on various insects associated with wood packaging materials. He officially joined the Otis Lab in June 2007 as a research entomologist. Baode received his bachelor's degree from Anhui Agricultural College in 1984. Baode received his master's degree from Beijing Agricultural University (now China Agricultural University) in China in 1989. He then conducted research on evaluating and improving techniques for employing egg parasitoid, the minute *Trichogramma* wasps, as biocontrol agents for cabbage butterflies and the European corn borer at Beijing Academy of Agricultural and Forestry Sciences until 1992.

Dr. Wang received a Ph.D. in Entomology from the University of Massachusetts in 1998 and was a candidate for M. PH in biostatistics (1996-1998, Department Biostatistics and Epidemiology, University of Massachusetts, Amherst). He has been involved in the Asian longhorned beetle and the emerald ash borer eradication programs and developed risk assessments for a number of insect pests that are frequently intercepted at the U.S. ports.

GET TO KNOW THE NEW CPHST TEAM MEMBERS!

CPHST SPOTLIGHT: JOHN ROGERS

John Rogers is a new risk analyst with CPHST PERAL. Previously, he was a port officer in Chicago under the auspices of both PPQ and Customs and Border Protection for four years. During that time, he worked as an officer in all the port functions as a regular officer, lead post office officer, lead maritime officer, a trainer, and co-chair of the port Pest Risk Committee. In addition, he created and maintained the port databases for a variety of local surveys and developed statistical applications to analyze the port's survey data to improve targeting. He did his dissertation at Michigan State University on the application of multifractal spectra to analyze plant disease spread. His thesis is from Oregon State University concerning the effect of liming on pasture production. In between stints in graduate school, he was a Peace Corps volunteer in Bolivia where he worked in both soil conservation and pest management. His undergraduate education was at Grinnell College (Grinnell, Iowa) in biology with a special emphasis on mathematics. In his spare time, he tries to keep his two girls out of trouble.

CPHST SPOTLIGHT: XIKUI WEI

Xikui Wei was born in Guangdong Province (neighboring Hong Kong) in China. He received his B.S. in Plant Protection in 1982 and M.S. in Entomology in 1985 from South China Agricultural University, Guangzhou, China. Upon graduation, he worked as an instructor in the same university until 1991. In July 1991, Xikui came to the United States to continue his study in entomology at West Virginia University in Morgantown, VA. Because he had never seen snow before leaving China and preferred to watch it on T.V., he transferred to Louisiana State University. He obtained his second M.S. in Entomology in 1995. He had begun to work as a research associate in May 1994 at Texas A&M University Research and Extension Center in Dallas, where he spent 10 years studying turfgrass entomology and urban pathology. In 2004, he joined USDA-ARS, Stoneville, MS, to work on fire ant baits research. He found that fire ants are fascinating creatures to do research on. Just recently Xikui joined CPHST Lab, Gulfport, MS, as an entomologist working to develop new methods for fire ants quarantine treatments for ball and burlapped nursery stocks and other commodities. He is happy to continue to work on fire ants and to live in a coastal city where he can go fishing--freshwater and saltwater. "Fishing is the best spare time" in his own words.

CPHST SPOTLIGHT: BOB SCHALL

As an undergraduate, Bob Schall studied botany and zoology to obtain a bachelor of arts degree in biology from Rutgers University. As a graduate student, Schall worked with maize dwarf mosaic and completed courses in plant pathology and related sciences to earn an M.S. from the University of Massachusetts.

Starting work with APHIS, he was a survey plant pathologist stationed at Purdue University in West Lafayette, IN. Afterwards, Schall served as a regional survey coordinator, stationed in Memphis, TN. He then moved to the Washington area and worked as an agriculturist preparing reports and manuals for various programs. As an agriculturist/technical writer, Schall prepared data sheets on introduced pests. Preparing the data sheets was more fun than work; in a sense, each data sheet was a biological puzzle that could be solved by finding the appropriate biological information. The work was probably similar to doing a Sunday crossword puzzle; however, a paycheck is received to complete the puzzle.

In May, Schall transferred to CPHST PERAL to work as a risk analyst. He hopes working as a risk analyst will be as interesting as working on the data sheets.

His wife, Mary, and he now live in Holly Springs and are in the process of settling into their new home.

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Plant Protection & Quarantine Mission

APHIS-PPQ safeguards agriculture and natural resources from the risks associated with the entry, establishment, or spread of animal and plant pests and noxious weeds. Fulfillment of its safeguarding role ensures an abundant, high quality, and varied food supply, strengthens the marketability of U.S. agriculture in domestic and international commerce, and contributes to the preservation of the global environment.

CPHST Mission

The Center for Plant Health Science and Technology supports PPQ regulatory decisions and operations through methods development work, scientific investigation, analyses and technology.

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Kendra, P.E., **M. Hennessey**, **W.S. Montgomery**, **E.M. Jones**, **N.D. Epsky**. 2007. Residential Composting of Infested Fruit: A Potential Pathway for Spread of *Anastrepha* Fruit Flies (Diptera: Tephritidae). Florida Entomol. 90(2): 314-320.

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